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Are conference special issues worthwhile?

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ABSTRACT

Background: Conference special issues are common, yet their value to journals, authors, and editors might not be clear.

Goal: Use citation rates to assess the performance of papers published in special issues, while bearing in mind that citation rates are not the be-all-and-end-all indicator of scientific merit.

Data: Citations from *Web of Science* to papers in the seven previous special issues of the *International Conference on Stickleback Behaviour and Evolution* – relative to: (1) citations to other papers published in the same journals in the same years, and (2) citations to stickleback papers published elsewhere in the literature in the same years.

From the journal perspective: Papers published inside conference special issues have approximately the same performance as papers published outside special issues in the same journal. However, results vary among issues, with some performing worse and some better than other papers published in the same journal.

From the author perspective: Papers published inside conference special issues garner fewer citations than papers on the same taxon (stickleback) published elsewhere; but the difference is often only modest. Moreover, the longevity of influence for papers published in recent (2000 onward) special issues appears better than for stickleback papers published elsewhere. Specifically, citation rates to stickleback papers published in special issues tend to increase with time since publication, relative to those stickleback papers published elsewhere.

From the editor perspective: Relative to other editing contexts, the collection of papers in a special issue can be more interesting; the review process is more collegial, constructive, and efficient; editorial decisions are more enjoyable; and the opportunity to advance the field is greater.

Keywords: *Gasterosteus aculeatus*, H index, impact factor, peer review, publication rate, scientific publication, scientific review, stickleback.

INTRODUCTION

The *Eighth International Conference on Stickleback Behaviour and Evolution*, hosted by Mike Bell, was held on 26–31 July 2015 at Stony Brook University. The present special issue of *Evolutionary Ecology Research* publishes the papers from that conference. Every

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conference special issue published in a journal has some sort of introduction or preface. Those 'papers' can take several forms, with the most common and easy one being a short introduction to the various papers in the issue. Our impression, however, is that prefaces of that sort are rarely read and even more rarely cited, making them of little value. We have therefore tried something different.

When we edited the proceedings of the previous conference on stickleback, also published in *Evolutionary Ecology Research*, we collaborated with some colleagues who attended the conference to write an introduction that attempted to present the state of the field and where it might be going in the near future (Hendry *et al*., 2013). The exercise was rewarding for us and perhaps useful for others, but it seems too soon to write another similar assessment. Yet it also seems (as noted above) that just listing the papers in the present special issue would not be very useful, helpful, or interesting. Instead, we thought it might be useful, or at least novel, to evaluate the utility of the entire enterprise of producing conference special issues.

Special issues resulting from conferences are often published in peer-reviewed journals, yet it might not be clear to what extent those issues are beneficial for journals, authors, or editors. To address this ambiguity, we here use citation statistics from the first seven stickleback special issues to quantitatively address two questions: (1) should journals publish special issues? and (2) should researchers publish their work in special issues? Our analyses are based on descriptive statistics rather than inferential statistics, mainly because we consider all (or nearly all) of the relevant papers, and are thus reporting actual population parameters rather than their estimates. However, more sophisticated analyses certainly could be undertaken, and various other exclusions or inclusions might be useful. Finally, we comment from personal experience how special issues are useful for the editors that shepherd them through the process.

The previous seven stickleback special issues published a total of 145 papers, which have been cited a total of 2461 times in *Web of Science* for an H index of 25. We use *Web of Science* owing to its more flexible search functions, whereas actual citations are higher in *Google Scholar* (some examples for individual papers are shown in the tables). The numbers specific to each special issue are shown in Table 1, and they suggest a remarkable consistency in influence. (Although rates are lower for the 2013 issue, it hasn't been out long

Table 1. Data from *Web of Science* for the previous seven stickleback special issues resulting from the *International Conference on Stickleback Behaviour and Evolution*

Special issue	Total papers	Total citations	Citations per year	H index
Behaviour 1985	26	457	0.55	11
Behaviour 1995	24	603	1.14	16
Behaviour 2000	19	414	1.28	12
Behaviour 2004	19	312	1.26	12
Behaviour 2008	15	212	1.57	11
Journal of Fish Biology 2009	22	314	1.79	10
Evolutionary Ecology Research 2013	20	149	1.86	7
Total	145	2461	1.31	25

Note: Citations per year is the mean across papers of the mean citations each paper received per year following publication. H index is the number of papers from each special issue cited at least that many times. That is, if the 11th most cited paper in an issue has 12 citations but the 12th most cited paper has 11 citations, the H index is 11.

enough to accrue many citations.) Overall, the typical paper in a stickleback special issue has been cited about 1.3 times per year, and 10 or more papers in a given special issue are typically cited more than 10 times.

SHOULD JOURNALS PUBLISH SPECIAL ISSUES?

Most journals receive many more papers than they can publish, which means that space in the journal can be severely limited (Wardle, 2012). If a journal then chooses to publish a special issue, it can subtract directly from other papers they might be able to publish, leading to increased costs (larger or additional issues), increased rejection rates, or increased delays from acceptance to publication. Why, then, should journals publish special issues? The reasons are several. First, journals sometimes commission special issues comprised mostly of review papers, which typically receive more citations, which boosts journal impact factor and thereby apparent prestige. Special issues based on conferences sometimes also include review papers that are well cited, but they mostly include empirical papers from which a substantial citation boost is less likely. Second, depending on the subject and the people involved, special issues – even those with an empirical focus – can attract cutting-edge work. At the same time, however, acceptance rates tend to be high in special issues, which might mean that some authors submit work they had a hard time publishing elsewhere. Thus, whether or not special issues have a positive or negative impact on a journal's standing and profile is not immediately obvious.

The seven previous stickleback issues (Table 1) afford an opportunity to assess whether special issues are beneficial for journals – at least from the perspective of citation rates. Using *Web of Science*, we obtained the mean per-year citation rate for papers published in the special issues and for papers published outside the special issues in the same journal and year (Fig. 1). In one instance (the first special issue in 1985), the journal seemingly did not

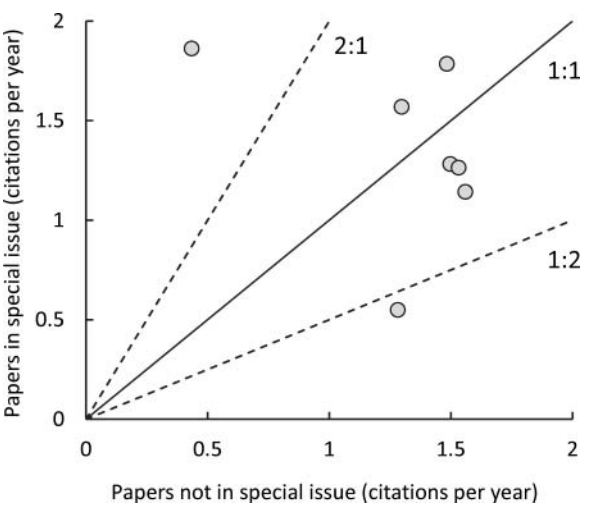

Fig. 1. Citation rates for papers inside versus outside special issues in the same journal/year based on the seven published stickleback special issues. The data points are, for each combination of journal and year, the mean (across papers) of the mean (across years for each paper) of the yearly per-paper citation rates.

benefit in that mean subsequent yearly citation rates were 0.55 for *Behaviour* papers in the special issue but 1.28 for *Behaviour* papers outside the special issue. In another instance (the most recent special issue in 2013), the journal seemingly did benefit, in that subsequent citation rates were 1.86 for *Evolutionary Ecology Research* papers in the special issue but 0.43 for *Evolutionary Ecology Research* papers outside the special issue. In the other cases, however, mean citations for papers in the special issue were about the same as those for papers outside the special issue. We might thus safely conclude that – at the very least – journals do not suffer from publishing special issues based on conferences.

What about really influential papers, which should be relatively few and far between? We extracted from *Web of Science* the ten most cited stickleback papers from special issues (Table 2). Although none of the citation levels are dramatic, the most cited papers in special issues have clearly been influential. Papers in the oldest special issues tend to dominate this list, presumably because older papers have had more time to accumulate citations. We therefore also compiled a list of the two most cited papers in each of the seven special issues (Table 3). Examination of the titles on both lists makes clear that some truly classic and influential papers have been published in stickleback special issues.

Table 2. The ten most cited papers according to *Web of Science* that have been published in stickleback special issues

Paper	Title	*Web of Science* citations	*Google Scholar* citations
Milinski (1985)	Risk of predation of parasitized sticklebacks (*Gasterosteus aculeatus* L.) under competition for food	148	183
Hendry *et al*. (2009)	Along the speciation continuum in stickleback	80	113
Robinson (2000)	Trade offs in habitat-specific foraging efficiency and the nascent adaptive divergence of sticklebacks in lakes	79	86
Reimchen (2000)	Predator handling failures of lateral plate morphs in *Gasterosteus aculeatus*: functional implications for the ancestral plate condition	72	89
Mackney and Hughes (1995)	Foraging behaviour and memory window in sticklebacks	52	77
Kingsley *et al*. (2004)	New genomic tools for molecular studies of evolutionary change in threespine sticklebacks	51	73
Reimchen (1995)	Predator-induced cyclical changes in lateral plate frequencies of *Gasterosteus*	47	57
Sargent (1985)	Territoriality and reproductive tradeoffs in the threespine stickleback, *Gasterosteus aculeatus*	47	54
Rowland (1995)	Do female stickleback care about male courtship vigour? Manipulation of display tempo using video playback	46	62
Barber and Huntingford (1995)	The effect of *Schistocephalus solidus* (Cestoda: Pseudophyllidea) on the foraging and shoaling behaviour of three-spined sticklebacks, *Gasterosteus aculeatus*	43	62

Table 3. The two most cited papers according to *Web of Science* in each of the seven previous stickleback special issues.

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Kingsley *et al*. (2004)	New genomic tools for molecular studies of evolutionary change in threespine sticklebacks	51	73
Barber *et al*. (2004)	Behavioural responses to simulated avian predation in female three spined sticklebacks: the effect of experimental *Schistocephalus solidus* infections	37	52
Baker *et al*. (2008)	An overview of life-history variation in female threespine stickleback	37	41
Heins and Baker (2008)	The stickleback–*Schistocephalus* host–parasite system as a model for understanding the effect of a macroparasite on host reproduction	34	39
Hendry *et al*. (2009)	Along the speciation continuum in sticklebacks	80	113
Candolin (2009)	Population responses to anthropogenic disturbance: lessons from three-spined sticklebacks *Gasterosteus aculeatus* in eutrophic habitats	23	32
Bell and Aguirre (2013)	Contemporary evolution, allelic recycling, and adaptive radiation of the threespine stickleback	22	25
Hendry *et al*. (2013)	Stickleback research: the now and the next	18	27

From the perspective of a journal with its eyes on prestige, the most pressing question might be: How do the above numbers compare to papers in our journal in the same year that were not published in the special issue? Extracting these numbers from *Web of Science*, we see that the top ten papers from the same journals/years have citation rates of 111–264, typically higher than the top ten papers from the stickleback issues. We then considered the most-cited paper inside versus outside the special issue for each journal/year (Fig. 2). The two numbers are very similar for the three most recent issues, which are those with the

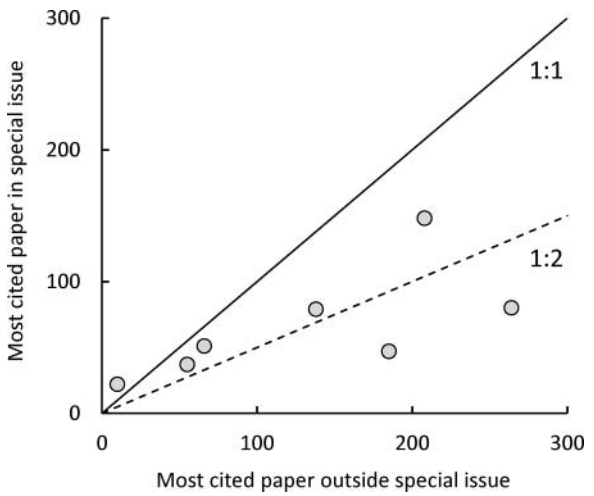

Fig. 2. Citations to the most cited paper inside versus outside the stickleback special issue in each journal/year.

fewest total citations. For older special issues that have accrued more citations, the most cited paper is typically outside the special issue. Overall, however, results aren't dramatically different for papers inside versus outside special issues, and they are likely biased against special issues because fewer papers are published there (145) than outside the special issue in the same journals/years (702 total). A more refined analysis, which we do not undertake here, would be to randomly subsample (multiple times) papers published outside the special issues to then recalculate the ten most cited papers.

Finally, we consider the 'longevity' of influence for papers from special issues relative to other papers in the same journals/years. This analysis asks: Does the relative influence of papers inside versus outside special issues change with the age of the special issue? Figure 3 shows the proportion of the total citations to papers published in each journal/year that were to papers in the special issue (normalized to proportion of papers published in the issue). Considerable variation occurs through time for each issue, presumably reflecting stochasticity; but the overall trend seems to be rather flat. That is, papers published in special issues have approximately the same longevity as papers published outside the special issue in the same journal/year.

We conclude that papers inside special issues are doing nearly as well, and sometimes better, than papers outside special issues in a given journal/year. More importantly, conference special issues mean that journals are supporting a collective scientific endeavour that brings researchers together in a shared arena to exchange ideas, which benefits the field even if it doesn't directly benefit the journal. Surely this service to the scientific community is something that all journals should promote.

SHOULD YOU PUBLISH IN A SPECIAL ISSUE?

Authors typically select journals for submission according to some perceived optimal combination of exposure (and hence citation rates), prestige (and therefore hiring prospects), cost (depending on resources), accessibility (depending on philosophy), and probability of

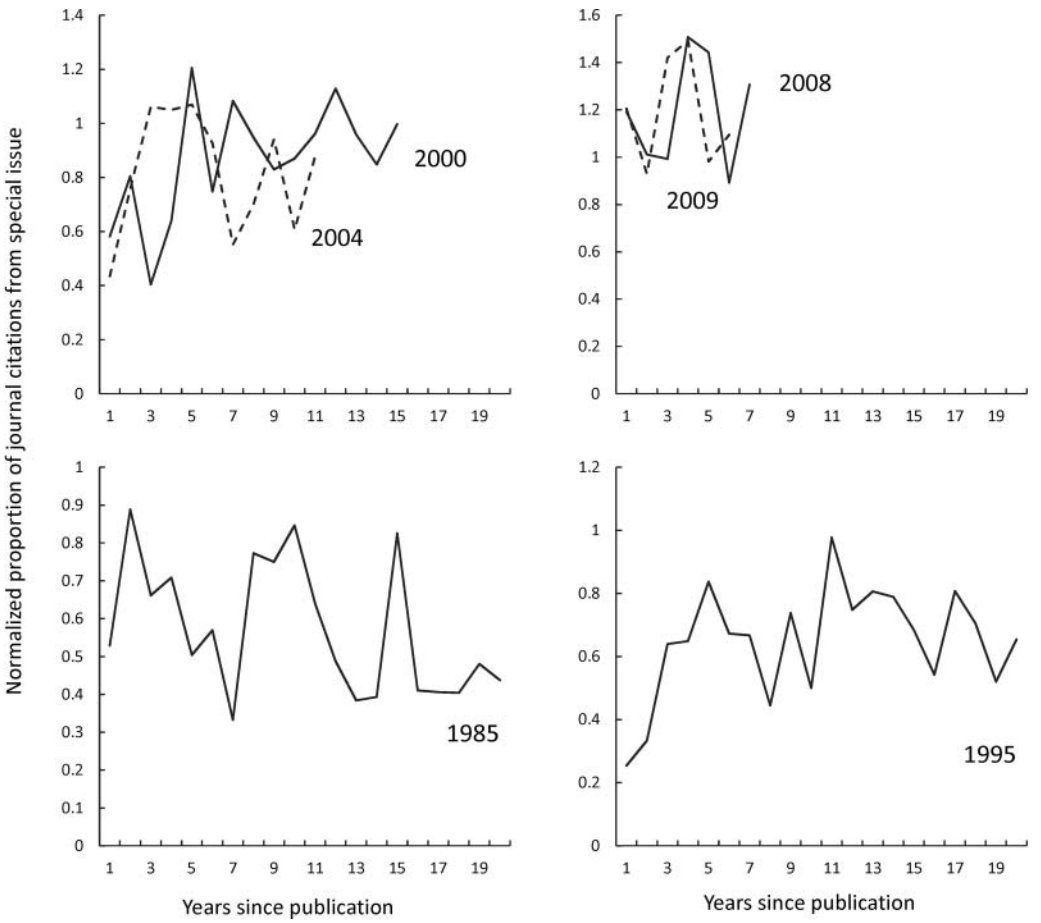

Fig. 3. Longevity of papers published inside versus outside special issues for each journal/year. Shown is the proportion of citations (to all papers inside relative to outside the special issue) divided ('normalized') by the corresponding proportion of papers (in the stickleback issue relative to all papers in the journal that year). Data past 20 years are not shown for the 1985 special issue. Dashed lines are used in some cases is simply to make the lines distinguishable.

acceptance (depending on haste). These factors trade off with each other and even the optimal strategy might not pay off owing to inherent stochasticity in the system (Aarssen *et al.*, 2008; Calcagno *et al.*, 2012; Salinas and Munch, 2015). How should special issues factor into an author's decision? Typical benefits of such issues can include exposure (at least to people in the same field), cost (usually non-existent), and probability of acceptance (generally high). Typical – or at least perceived – detriments include prestige (sometimes assumed to be low) and exposure (to people outside the field). We can consider how some of these factors play out by examining citation rates.

We searched *Web of Science* for papers about 'stickleback' in the year each special issue was published. Interpreting the results was not straightforward because *Web of Science* uses 'keywords plus' in its 'topic' search, which thereby returned a number of papers that were

Table 4. Summary of papers about stickleback in *Web of Science* in each year a special issue was published

Year	Papers with 'stickleback' as a topic	Papers about stickleback	Most citations to a paper not in the special issue	Most citations to a paper not in the special issue after excluding some journals	Most citations to a paper in the special issue
1985	56	56	108	108	148
1995	112	62	294	272	52
2000	122	60	394	197	79
2004	164	89	479	212	51
2008	226	111	176	153	37
2009	237	109	133	114	80
2013	296	134	31	31	22

Note: The first data column shows the number of hits using 'stickleback' as the 'topic'. The second data column shows the number of papers remaining after excluding those that did not appear to be about stickleback. The third data column shows citations to the most cited paper about stickleback in that year but not in the special issue. The fourth data column shows citations to the most cited paper about stickleback in that year but not in the special issue, excluding papers published in *Nature*, *Science*, *Proceedings of the National Academy of Sciences USA*, *Current Biology*, and *Trends in Ecology and Evolution*. The final column shows the most cited paper in the stickleback special issue from that year.

not about stickleback. Many of these non-stickleback papers made some peripheral sense, as they were general review papers or were about other fish systems used to study behaviour or evolution, such as guppies, killifish, sailfin mollies, whitefish, charr, trout, salmon, cave fish, and others. Some other hits, however, were puzzling: my favourite being 'No effect of blue on winning contests in Judo' (it cited a paper – by Rowland – that had 'stickleback' in its title). Owing to these non-stickleback 'hits' in the topic search for stickleback, we had to scan through the list of papers to try to exclude those not actually about stickleback (Table 4). We can't promise to have done this perfectly but we should be rather close and – in any case – not biased.

We first compared the maximum citations to a stickleback paper published in each special issue to the maximum citations for a stickleback paper published elsewhere in the literature in the same year. In every case save one (1985), the most cited stickleback paper was outside the special issue, with the top paper in the special issue garnering 11% (2004) to 71% (2013) as many citations as the top paper outside the special issue. However, papers in general journals (*Science*, *Nature*, *Proceedings of the National Academy of Sciences USA*, and *Current Biology*) and papers in the primary disciplinary review journal (*Trends in Ecology and Evolution*) were often huge outliers and hardly a fair comparison to empirical disciplinary journals. We therefore next made the above comparisons after excluding papers published in those five journals. In this case, the differences were smaller, although the most cited paper in a given year remained outside the special issue in all cases but 1985 (Table 4). However, even more so than in the previous section, many fewer papers were published in special issues than elsewhere – and a subsampling approach would be necessary to account for this bias.

The preceding paragraph considered only two papers per year – the most cited from the special issue and the most cited from elsewhere in the literature. However, the typical person submitting a paper is probably more interested in what to expect on average. We therefore

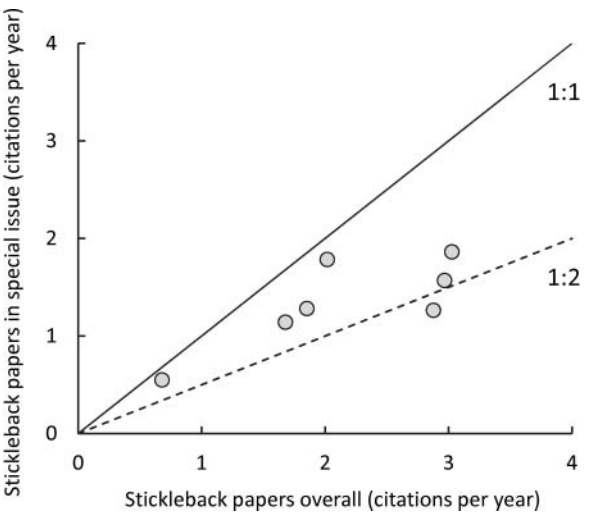

Fig. 4. Comparison of citation rates for papers inside the seven stickleback special issues versus stickleback papers in the overall literature in the same year. Data points are the mean (across papers) of the mean (across years for each paper) of the yearly per-paper citation rates. Excluded are papers published in *Nature*, *Science*, *Proceedings of the National Academy of Sciences USA*, *Current Biology*, and *Trends in Ecology and Evolution*.

next calculated the mean annual citation rate for stickleback papers inside special issues versus the entire literature in the same years, again excluding the above five journals (Fig. 4). In all cases, mean citation rates were lower for papers inside the special issue than in the literature as a whole, but the difference was often only modest. For instance, papers published inside special issues were cited 68% (mean of the yearly means) as often as typical stickleback papers from the same year. Given that most people probably do not submit their very best work to special issues, we speculate that papers in special issues actually punch well above their weight.

What about the longevity of a paper you publish in a special issue versus the literature as a whole? Here we calculated the total number of citations per year to the papers in each special issue relative to stickleback papers in general (i.e. in the special issue and elsewhere), excluding papers published in the five journals as noted above. For the older special issues (1985 and 1995), the relative importance of papers in the special issue started high and then stabilized to remain – ignoring some year-to-year fluctuations – relatively constant through time (Fig. 5). For the subsequent special issues (2000 onward), the relative importance of stickleback papers increased through time, suggesting that papers published in special issues could have more staying power than papers published elsewhere.

We suggest that – if only from the perspective of citation rates – authors will probably want to target their very best empirical work to journals with a higher impact than those typically publishing conference special issues. However, it could be a better decision to target other solid work for special issues, where exposure to people in the same field will be higher, where citation rates can be as high as elsewhere, and where acceptance is more likely.

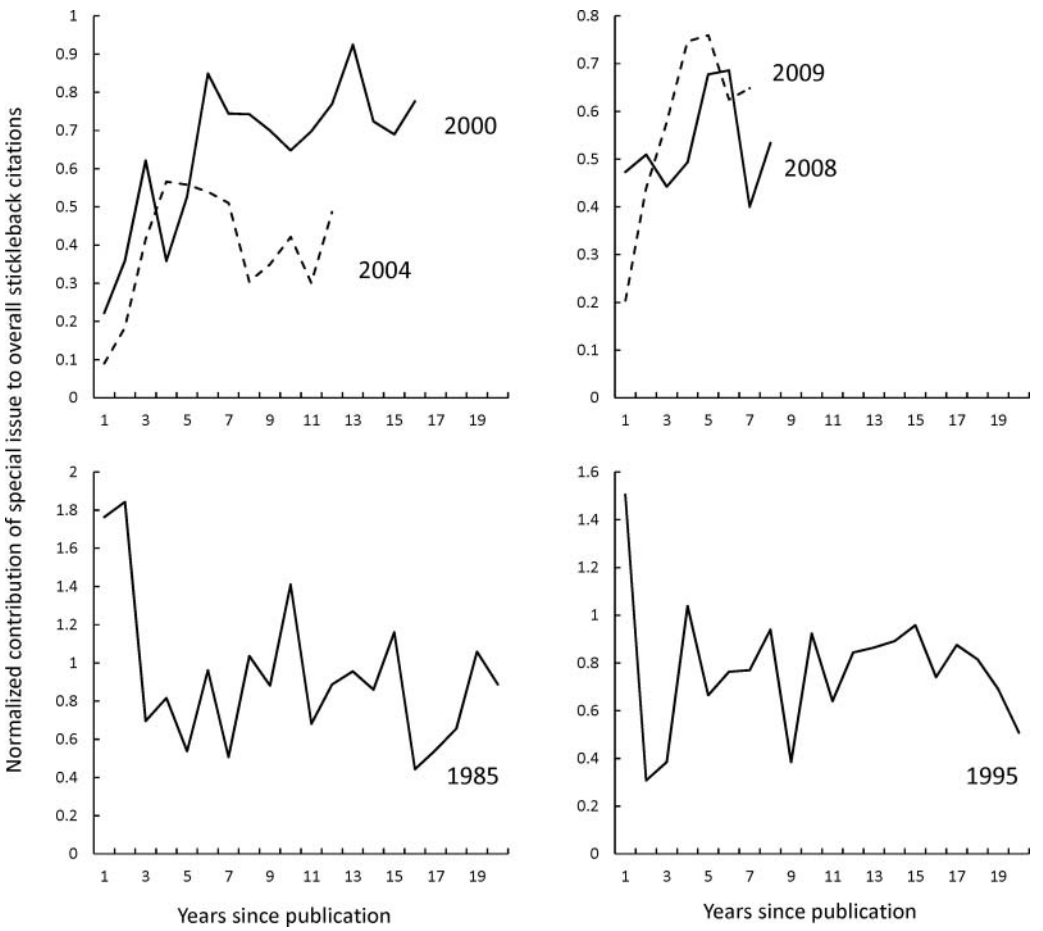

Fig. 5. Longevity of papers published in special issues relative to stickleback papers published elsewhere (excluding the five journals noted in the caption for Fig. 4) as obtained by a *Web of Science* search for the topic 'stickleback'. Shown is the proportion of citations (to papers inside the special issue versus stickleback papers overall) divided ('normalized') by corresponding proportion of papers (in the stickleback issue relative to all papers in the journal that year), again excluding papers published in five journals (see Fig. 4). Data past 20 years are not shown for the 1985 special issue. Dashed lines are used in some cases is simply to make the lines distinguishable.

SHOULD YOU EDIT A SPECIAL ISSUE?

We have now edited two special issues on stickleback – both for *Evolutionary Ecology Research*. The experience has been rewarding and it allows, in combination with previous editing of other special issues, some insight into the benefits for editors. First, editing a conference special issue affords an opportunity to read a diverse set of interesting papers; in essence, an editor gets a contemporary cross-section of work in a given field from a diversity of authors. As an example, the present special issue has 27 papers – including this introduction (Table 5), one more than the largest previous stickleback special issue – the very first

Table 5. The 26 papers (excluding the Introduction) in the 2016 *Evolutionary Ecology Research* stickleback special issues

Paper	Title
Aguirre *et al*. (2016)	Evolutionary diversification of body form and the axial skeleton in the Gasterosteoidei: the sticklebacks and their closest relatives
Bakhvalova *et al*. (2016)	Long-term changes in the role of threespine stickleback (*Gasterosteus aculeatus*) in the White Sea: predatory fish consumption reflects fluctuating stickleback abundance during the last century
Bakker (2016)	No evidence of sex reversal by means of experimentally altered sex ratios in threespine stickleback
Bell *et al*. (2016)	Reintroduction of threespine stickleback into Cheney and Scout Lakes, Alaska
De Winter *et al*. (2016)	Knights in shining armour are not necessarily bold: defensive morphology correlates negatively with boldness, but positively with activity, in wild threespine stickleback, *Gasterosteus aculeatus*
Di Poi *et al*. (2016)	Evolution of stress reactivity in stickleback
Divino *et al*. (2016)	Osmoregulatory physiology and rapid evolution of salinity tolerance in threespine stickleback recently introduced to fresh water
Feller *et al*. (2016)	Habitat choice and female preference in a polymorphic stickleback population
Heins *et al*. (2016)	Consumptive and non-consumptive effects of predation by introduced northern pike on life-history traits in threespine stickleback
Ishikawa *et al*. (2016)	Comparison of freshwater tolerance during spawning migration between two sympatric Japanese marine threespine stickleback species
Ivanova *et al*. (2016)	The White Sea threespine stickleback population: spawning habitats, mortality, and abundance
Izen *et al*. (2016)	Coarse- and fine-grained phenotypic divergence among threespine stickleback from alternating lake and stream habitats
James *et al*. (2016)	A fluorescence *in situ* hybridization (FISH) protocol for stickleback tissue
Klepaker *et al*. (2016)	Selective agents in the adaptive radiation of Hebridean sticklebacks
Kurz *et al*. (2016)	Shifts in life-history traits of two introduced populations of threespine stickleback
Martinez *et al*. (2016)	The relative roles of genes and rearing environment on the spatial cognitive ability of two sympatric species of threespine stickleback
Mobley *et al*. (2016)	Olfactory perception of mates in ecologically divergent stickleback: population parallels and differences
Ravinet *et al*. (2016)	Trophic niche differentiation and phenotypic divergence among cryptic species of Japanese ninespine sticklebacks
Reimchen *et al*. (2016)	Sex matters for defence and trophic traits of threespine stickleback
Reyes and Baker (2016)	Prolonged swimming performance within the threespine stickleback (*Gasterosteus aculeatus*) adaptive radiation and the effect of dietary restriction
Robertson *et al*. (2016)	Parallelism and divergence in immune responses: a comparison of expression levels in two lakes
Roufidou *et al*. (2016)	Overripening of eggs and changes in reproductive hormones in the threespine stickleback, *Gasterosteus aculeatus*

Table 5. – *continued*

Paper	Title
Rybinka *et al*. (2016)	Dynamics of parasite community during early ontogenesis of marine threespine stickleback, *Gasterosteus aculeatus*
von Hippel *et al*. (2016)	The ninespine stickleback as a model organism in arctic ecotoxicology
Wright *et al*. (2016)	Male red throat coloration, pelvic spine coloration, and courtship behaviours in threespine stickleback
Wund *et al*. (2016)	Morphological evolution of an anadromous threespine stickleback population within one generation after reintroduction to Cheney Lake, Alaska

issue in 1985. Of particular interest to us were the two sets of papers that set the stage for rapidly developing stickleback systems, especially the White Sea and Alaskan lakes experimentally colonized with marine stickleback (Table 5). All of these papers are ready for reading and citing!

Second, the review process is much more efficient, collegial, and constructive than in other contexts. For instance, nearly all of the 58 people we invited to review papers for the present special issue agreed to do so, and nearly all of the reviews were very careful and constructive and submitted on time. These outcomes stand in sharp contrast to our other editing experiences, and with the general state of peer review in ecology and evolution (Grod *et al*., 2008, 2010; Aarssen *et al*., 2009; McPeek *et al*., 2009). Our impression is that everyone views special issues as beneficial for the field and works together to make them as good as possible.

Third, making editorial decisions is usually much more enjoyable. Although not every paper submitted to a special issue is published there, acceptance rates are generally very high. With much of the anxiety about acceptance versus rejection out of the way, editing becomes a rewarding process of working with reviewers and authors to make the papers as good as they can be. This process is particularly rewarding when working with junior researchers for whom rejection anxiety can be extremely high – although perhaps unwarranted given that even 'successful' ecologists are often rejected (Cassey and Blackburn, 2004).

Fourth, conference special issues are important for the field, the community, and the continuance of the conference. For instance, they greatly facilitate scientific interactions by pointing authors to opportunities for cross-citation within the special issue, which can lead to new collaborations. Moreover, the field as a whole benefits from collections of related work in special issues, and the conference has valued-added for participants.

Yet we are stickleback biologists – so what could an editor not working with the focal taxon or topic get out of a special issue? For this, let's turn to *Evolutionary Ecology Research* Editor-in-Chief Mike Rosenzweig for his thoughts, which were sent to us when he reviewed this paper in manuscript form. 'I would have added one important item to your list. Virtually all biological investigations gravitate towards a focus on one or a very few model systems. Each of these will be pursued with a doggedness and an encyclopaedic comprehensiveness that cannot be accomplished without the focus. But how do we settle upon which systems will be our model systems? I believe special issues are likely to be part of the answer. For example, in my own case, I was well aware of investigations dealing with

sticklebacks. But the special issues brought that awareness to a new level. I began to see more and more of the interlocking, fascinating and general problems that the stickleback crowd manages to engulf. Beautiful. I have no doubt that I would have failed to understand this without the special issues to focus my attention.'

Although we have greatly enjoyed editing these special issues, it is important to get fresh perspectives at reasonable intervals, and so we invite other stickleback biologists to edit the next special issue – for the *Ninth International Conference on Stickleback Behaviour and Evolution* to be held in Japan in 2018. See you there!

ACKNOWLEDGEMENT

We thank Theo Bakker for pointing out that the 1995 special issue had two volumes although only one had been indexed in *Web of Science*.

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